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NEARCTIC *OLETHREUTES*: FIVE NEW SYNONYMIES, TWO REVISED STATUSES, AND NOTES (LEPIDOPTERA: TORTRICIDAE)[1]

WILLIAM E. MILLER

Department of Entomology, University of Minnesota, St. Paul, Minnesota 55108.

Abstract.—Seven nearctic or holarctic species are treated primarily, and two palaearctic species secondarily. The following are new synonymies: *Olethreutes coruscana* (Clemens) (= *O. puncticostana* (Walker) and *O. constellatana* (Zeller)); *O. metallicana* (Hübner) (= *O. murina* (Packard) and *O. major* (Walsingham)); *O. obsoletana* (Zetterstedt) (= *O. kennethana* McDunnough). The latter two species are thus holarctic. *Olethreutes glaciana* (Möschler) and *O. agilana* (Clemens) are shown to differ structurally from the palaearctic *O. bipunctana* (Fabricius) and *O. fuligana* (Hübner), respectively; the second is removed from the synonymy of the fourth. *Olethreutes ferrolineana* (Walker), currently misidentified, is removed from the synonymy of *O. coruscana*. The female currently associated with the male *O. troglodana* (McDunnough) is implausible, and a plausible female is identified.

More than 80 species of *Olethreutes* are known in North America where the genus appears to attain its greatest diversity (Powell, 1983). The known larvae feed on leaves and other soft tissues of perennial plants. The most recent generic treatment of nearctic species (Heinrich, 1926) is out of date. The nearctic species are plagued with taxonomic confusion due to interspecific similarity, intraspecific variability, and inadequate type study. The problems addressed here are similar to ones dealt with earlier (Miller, 1979). They became apparent during attempts to identify upper midwest species. Seven nearctic or holarctic species are treated here primarily, and two palaearctic species secondarily. All are illustrated to aid identification of both sexes.

Only original descriptions and revisions are cited in the nomenclatural summaries. Purely palaearctic synonymies are omitted. Spelling of names follows Powell (1983). The letter n refers to the number of specimens underlying a particular statement or conclusion, and ± denotes standard error. Forewing length is used as a size index; its validity for this purpose is documented elsewhere (Miller, 1977).

Museum abbreviations are: AM, American Museum of Natural History, New York; AP, Academy of Natural Sciences of Philadelphia; BM, British Museum (Natural History), London; CN, Canadian National Collection, Ottawa; HU, Zoo-

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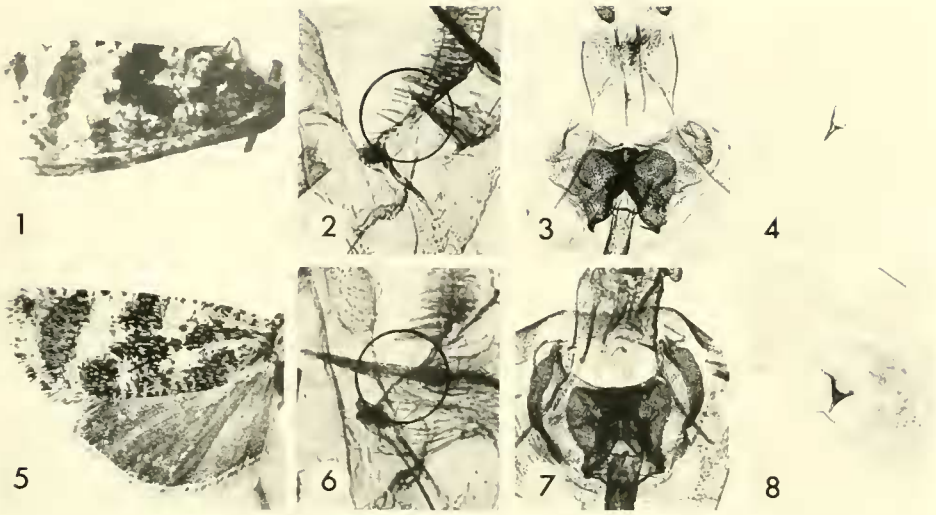


Figs. 1–8. *Olethreutes coruscana* and *O. ferrolineana*. 1, Wings of *O. puncticostana* lectotype male. 2, Part of male genitalia of preceding with valval arch circled. 3, Sterigma and associated structures of female *O. coruscana* from Detroit, Mich. (prep. BJT 61). 4, Corpus bursae and signum of preceding. 5, Wings of *O. ferrolineana* female from Livingston Co., Mich. 6, Part of male genitalia of *O. ferrolineana* lectotype with valval arch circled. 7, Sterigma and associated structures of preceding *O. ferrolineana* female (prep. MMD 63). 8, Corpus bursae and signum of preceding.

logisches Museum, Humboldt-Universität, Berlin; IS, Illinois Natural History Survey, Urbana; LCM, Natural History Museum of Los Angeles County, Los Angeles, California; MS, Michigan State University Entomology Museum, East Lansing; MZ, Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts; NM, National Museum of Natural History, Washington, D.C.; UL, University of Lund, Sweden; UMI, University of Michigan Museum of Zoology, Ann Arbor; UMN, University of Minnesota, St. Paul; and UW, University of Wisconsin, Madison.

Olethreutes coruscana (Clemens)

Figs. 1–4

Antithesia coruscana Clemens (1860: 346) (lectotype designated and illustrated by Miller, 1973a: male, North America, no date, forewing 9.0 mm long, in AP).

Sciaphila puncticostana Walker (1863: 339) (lectotype selected by N. S. Obraztsov, designated and illustrated here in Fig. 1–2: male, "Type . . . ; N. Scotia, Redman; . . . genit. slide No. 11624," no date, forewing 9.5 mm long, in BM, photos in AM). NEW SYNONOMY.

Sericoris constellatana Zeller (1876: 279) (lectotype selected by N. S. Obraztsov, designated here: male, ". . . Ohio, Schl. . . . ; Type; . . . genit. slide No. 11622," no date, forewing 9.5 mm long, in BM, photos in AM). NEW SYNONYMY.

Olethreutes constellatana; Heinrich (1926: 174).

Discussion.—This species has been most recently known as *O. constellatana*. The new synonymies are unmistakable. Male valval arches of all type specimens have setae nearly throughout; as pointed out by Heinrich (1926), this is a sure

character state (Fig. 2) separating this species from its most similar relative, *O. ferrolineana,* the male valval arch of which lacks such setae (Fig. 6).

The digitus bearing the cluster of setae at the base of the male valval cucullus usually projects outward in genital preparations, as in Heinrich (1926: fig. 429) and Miller (1973a: fig. 9b). The digitus is folded inward in the *O. puncticostana* lectotype slide, however (Fig. 2).

This species accounts for the fourth of at least six long-standing misidentifications of Clemens olethreutine types (Miller, 1973a); previous ones are discussed elsewhere (Miller, 1973b, 1974, 1979).

The larval host is unknown.

Olethreutes ferrolineana (Walker), Revised Status
Figs. 5–8

Carpocapsa ferrolineana Walker (1863: 395) (lectotype selected by N. S. Obraztsov, designated and illustrated here in Fig. 6: male, "Type . . . N. America, Carter . . . genit. slide No. 11621," no date, forewing 7.0 mm long, in BM, photos in AM).

Olethreutes ferrolineana; Heinrich (1926: 175).

Olethreutes coruscana (not Clemens 1860: 346); Heinrich (1926: 175).

Sericoris argyroelana Zeller (1876: 277) (lectotype selected by N. S. Obraztsov, designated here: female, "N. York, Speyer . . . Type . . . genit. slide No. 11650," no date, forewing 7.5 mm long, abdomen glued, in BM, photos in AM).

Discussion.—This species has been most recently known as *O. coruscana.* It is the one alluded to in the foregoing discussion with much of the male valval arch lacking setae (Fig. 6). Heinrich (1926) correctly identified it, but placed it as a synonym of *O. coruscana.*

Zeller's (1876) description of *O. argyroelana* mentions only males, but the glued abdomen of the lectotype is female. Structural details are not clearly discernible in the preparation, but the genitalia seem more like those of *O. coruscana* than *O. ferrolineana.* Hence there is doubt whether the glued abdomen is the correct one. The darker hues and more distinct patterning of lectotype forewings match *O. ferrolineana,* however.

Unlike most genital preparations of *O. ferrolineana,* that of the lectotype male has the setal bearing digitus at the base of the cucullus folded inward (Fig. 6).

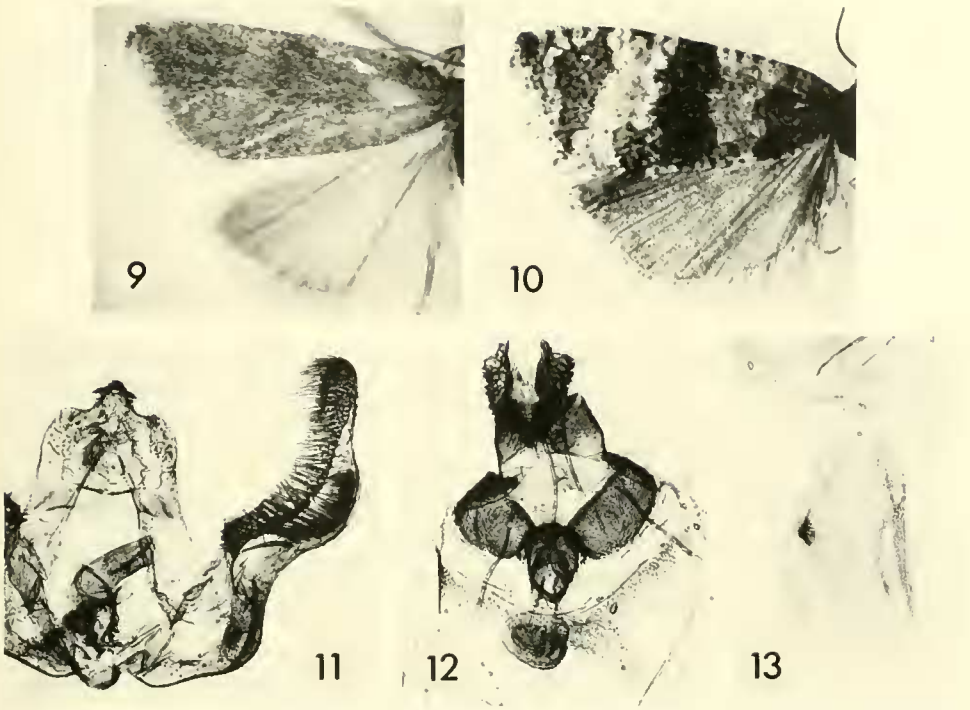
The larval host is unknown.

Olethreutes metallicana (Hübner)
Figs. 9–13

Tortrix metallicana Hübner (1796–99: pl. 11, fig. 68) (type unknown).

Penthina murina Packard (1867: 60) (lectotype designated and illustrated here in Fig. 9, 11: male, ". . . Type 14307 . . . C(aribou) Is., Labrador . . . *Penthina murina* Pack. lectotype des. W. E. Miller," genit. prep. JCL 1026831, no collection date, forewing 9.0 mm long, in MZ). New Synonymy.

Penthina major Walsingham (1895: 502) (lectotype selected by N. S. Obraztsov, designated and illustrated here in Fig. 10: male, "Type . . . Loveland, Colorado . . . VII.1891, Smith . . . genit. slide No. 11623," forewing 11.0 mm long, in BM, photos in AM). New Synonymy.



Figs. 9–13. *Olethreutes metallicana*. 9, Wings of *O. murina* lectotype male. 10, Wings of *O. major* lectotype male. 11, Male genitalia of *O. murina* lectotype. 12, Sterigma and associated structures of female from St. Paul, Minn. (prep. DH 915804). 13, Corpus bursae and signum of preceding.

Olethreutes puncticostana (not Walker 1863: 339); Heinrich (1926: 176).
Olethreutes puncticostana major; Heinrich (1926: 177).

Discussion.—This species has been most recently known in the nearctic as *O. puncticostana*. Heinrich (1926) misidentified both *O. murina* and *O. puncticostana*, placing the former as a synonym of the latter. He also suggested that *O. major* is different from *O. metallicana* but offered no supporting evidence.

In maculation (Figs. 9–10) and male genitalia (Fig. 11), I found no differences between examples from the nearctic (20 n) and palaearctic (16 n). Distinctness of forewing pattern varies similarly in the palaearctic (Bradley et al., 1979). In female genital structure (Fig. 12), no differences in shape were apparent. However, female genitalia of the palaearctic sample (3 n) seemed more heavily sclerotized than nearctic counterparts (6 n). Such a difference could be spurious considering the small sample sizes; if real, it is not of signal importance. Genitalia of palaearctic examples are illustrated by Bentinck and Diakonoff (1968), Pierce and Metcalfe (1922), and others.

In forewing length, males, which were represented in larger numbers than females, averaged 8.6 ± 0.2 mm for eastern nearctic specimens (12 n), and 8.2 ± 0.1 mm for palaearctic specimens (12 n). The difference is not significant statistically. Nearctic examples originating west of the 100th meridian were excluded

in the foregoing comparison because size in western nearctic populations is greater than in eastern (Heinrich, 1926).

Nearctic examples originated in Alberta, British Columbia, Colorado, Labrador, Manitoba, Michigan, Minnesota, New York, Ontario, and Quebec (AM, CN, IS, MS, MZ, UW); palaearctic examples, in England and Germany (AM, NM).

The larval host in the palaearctic is *Vaccinium* spp. (Bradley et al., 1979, and others); the larval host is unknown in the nearctic. Nearctic capture dates range from 24 June to 27 July (15 n).

Olethreutes glaciana (Möschler)

Figs. 14–17, 18, 20

Sericoris glaciana Möschler (1860: 380) (presumed holotype: male, Labrador, Hoffthl., . . . , no date, Coll. Möschler, genit. prep. WEM 68841, forewing 7.5 mm long, in HU).

Penthina dealbana Walker (1863: 374) (lectotype selected by N. S. Obraztsov, designated and illustrated here in Fig. 15: male, "Type . . . N. Scotia, Redman . . . genit. slide No. 11629," no date, forewing 7.0 mm long, in BM, photos in AM).

Sericoris fuscalbana Zeller (1876: 284) (lectotype selected by N. S. Obraztsov, designated here: male, "Ohio, Schl.; Type; . . . genit. slide No. 11627," no date, abdomen glued, in BM, photos in AM).

Argyroploce castorana McDunnough (1922: 45) (holotype: male, Nordegg, Alta., July 7, J. McDunnough, in CN).

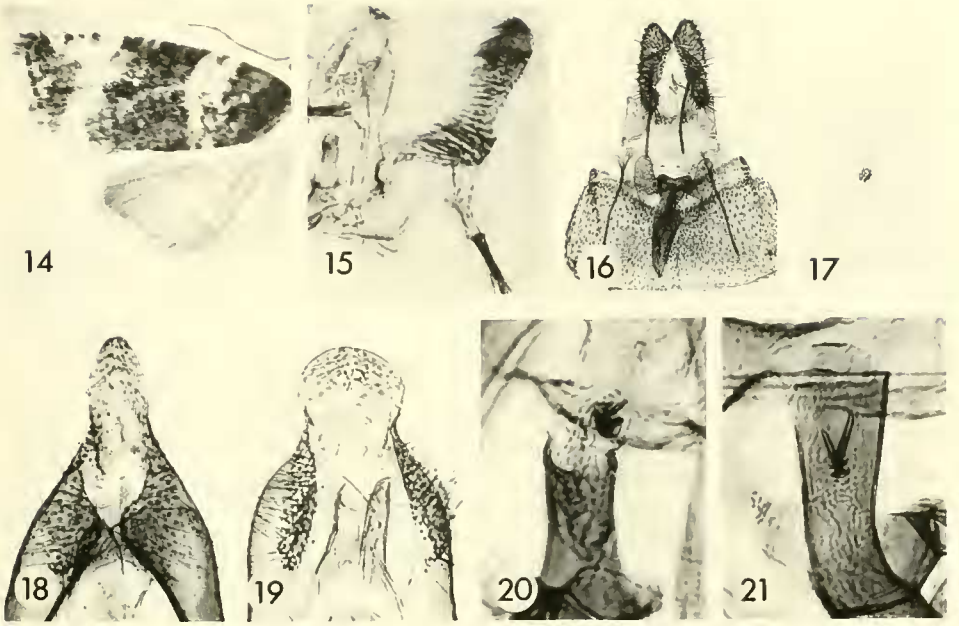
Olethreutes glaciana; Heinrich (1926: 182).

Discussion.—Prompted by Benander's (1940) suggestion that *O. glaciana* might be a synonym of the palaearctic *O. bipunctana* (Fabricius), and Diakonoff's (1973) opposing statement that they differ in details of valval shape, I compared examples that included the presumed holotype of *O. glaciana*. The *O. glaciana* examples were collected in Labrador, Michigan, New Hampshire, New York, North Carolina, Ontario, Washington, West Virginia, and Wisconsin (AM, HU, LCM, MS, NM, UMI, UW); the *O. bipunctana*, in Czechoslovakia, Germany, and Italy (AM, NM). I found more differences that seem to refute conspecificity; the most pronounced are summarized below.

For males of *O. glaciana* and *O. bipunctana*, respectively, forewing length was 7.2 ± 0.1 (18 n), and 8.6 ± 0.2 (9 n); the uncus was twice as long as wide (Fig. 18) (21 n), and equally as long as wide (Fig. 19) (5 n); and cornuti originated from a sclerotized plate (Fig. 20) (3 n), and from a membrane (Fig. 21) (6 n). For females of *O. glaciana* and *O. bipunctana*, respectively, forewing length was 6.3 ± 0.2 (12 n), and 7.6 ± 0.1 (9 n); and posterior apophyses were shorter or no longer than anterior apophyses (8 n), and longer than anterior apophyses (5 n). Forewing length of each sex averaged significantly less in *O. glaciana* than in *O. bipunctana* ($P_t < .001$). The above states of *O. bipunctana* genital characters are also visible in published illustrations (Diakonoff, 1973; Hannemann, 1961; Kuznetsov, 1978; and others).

In most slide preparations, the uncus of *O. glaciana* curves caudally, and its length may thereby be obscured (Fig. 15); viewing it in a flattened position brings out its true dimensions (Fig. 18). Also, the sclerotized plate with cornuti (Fig. 20) is easily lost during preparation unless care is taken to retain it.

The *O. glaciana* larva feeds in rolled leaves of *Betula, Populus, Acer*, and others



Figs. 14–21. *Olethreutes glaciana* and *O. bipunctana*. 14, Wings of *O. glaciana* female from Blackwater Falls St. Park, W. Va. 15, Male genitalia of *O. dealbana* lectotype. 16, Sterigma and associated structures of female *O. glaciana* from Delta Co., Mich. (prep. KL 71). 17, Corpus bursae and signum of preceding. 18, Uncus of male *O. glaciana* from Forest Co., Wis. (prep. PB 5). 19, Uncus of male *O. bipunctana* from Torfhaus, Germany (prep. DH 601813). 20, Aedeagus and cornuti of male *O. glaciana* from Schoolcraft Co., Mich. (prep. DH 610813). 21, Aedeagus and cornuti of preceding *O. bipunctana* male.

(Prentice, 1965). The *O. bipunctana* larva feeds on *Vaccinium, Pyrola,* and *Rhododendron* (Bentinck and Diakonoff, 1968; Swatschek, 1958).

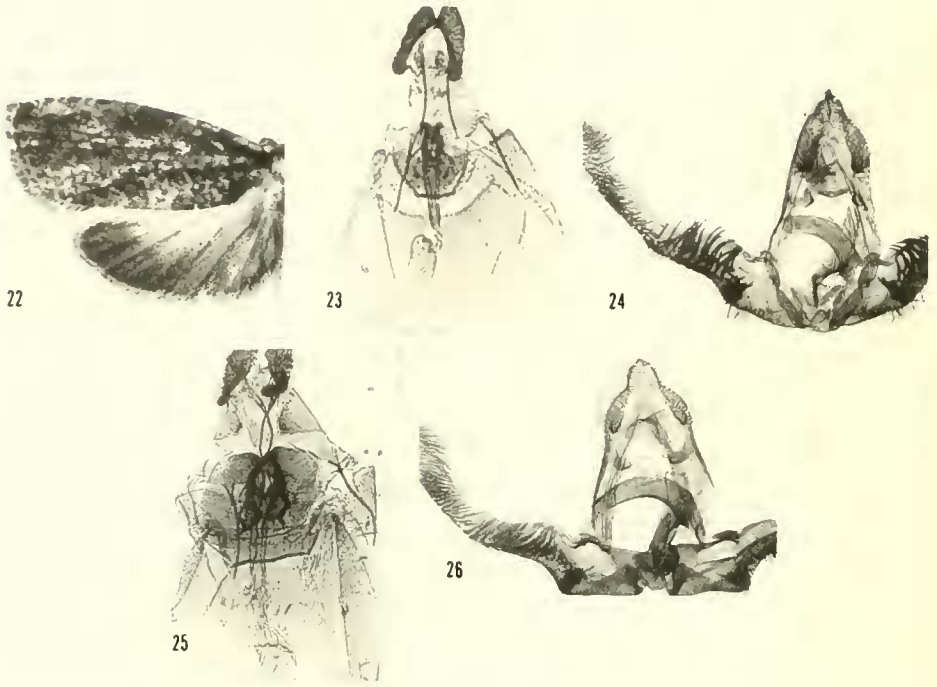
Olethreutes agilana (Clemens), Revised Status

Figs. 22–24

Endopiza agilana Clemens (1860: 359) (lectotype designated by Darlington, 1947, illustrated by Miller, 1973a: male, North America, no date, forewing 5.5 mm long, in AP).
Olethreutes agilana; Heinrich (1926: 171).
Pristerognatha fuligana (not Hübner, 1796–99); Oku (1979: 617).

Discussion.—In synonymizing *O. agilana* under *O.* (= *Pristerognatha*) *fuligana*, Oku (1979) cited overall similarity in genitalia illustrations and larval hosts (Bentinck and Diakonoff, 1968; Heinrich, 1926; Kuznetsov, 1978). He did not mention comparing actual specimens.

In maculation, specimens of *O. agilana* (Fig. 22) and *O. fuligana* are scarcely separable. Genitally, they differ in both sexes, however. In females, the main difference is in sterigmata. That of *O. agilana* (Fig. 23) is small in outline with irregular margins, while that in *O. fuligana* (Fig. 25) is large with smooth margins (3 n and 1 n, respectively). Neither have signa. In males, differences include longer socii and a larger angle between the sacculus and valval neck in *O. agilana* than in *O. fuligana*; and the uncus area of *O. agilana* has an anal slit that is lacking



Figs. 22–26. *Olethreutes agilana* and *O. fuligana*. 22, Wings of *O. agilana* male from Essex Co., N. J. 23, Sterigma and associated structures of female *O. agilana* from "Penn." (prep. WEM 78844). 24, Male genitalia of *O. agilana* from Cincinnati, O. (prep. WEM 78842). 25, Sterigma and associated structures of female *O. fuligana* from Germany (prep. WEM 68842). 26, Male genitalia of *O. fuligana* presumably from Germany (prep. 1-Obr. 1960).

in *O. fuligana* (Figs. 24, 26) (4 n and 1 n, respectively). These differences cannot be dismissed as due to an anomalous, small sample of *O. fuligana*, a rare species in collections; the pertinent character states can also be seen in illustrations of Bentinck and Diakonoff (1968) and Kuznetsov (1978). Forms so readily separable by structural characters cannot be considered conspecific.

The *O. agilana* larva feeds in stems of *Impatiens* (Heinrich, 1926). Forewing length ranges from 5.0 to 6.5 mm (18 n), and adult capture dates from 30 May to 8 July (14 n).

Examples of *O. agilana* originated in Maryland, New Jersey, Ohio, and Pennsylvania (18 n) (NM, AM, LCM); *O. fuligana*, in Germany (2 n) (HU).

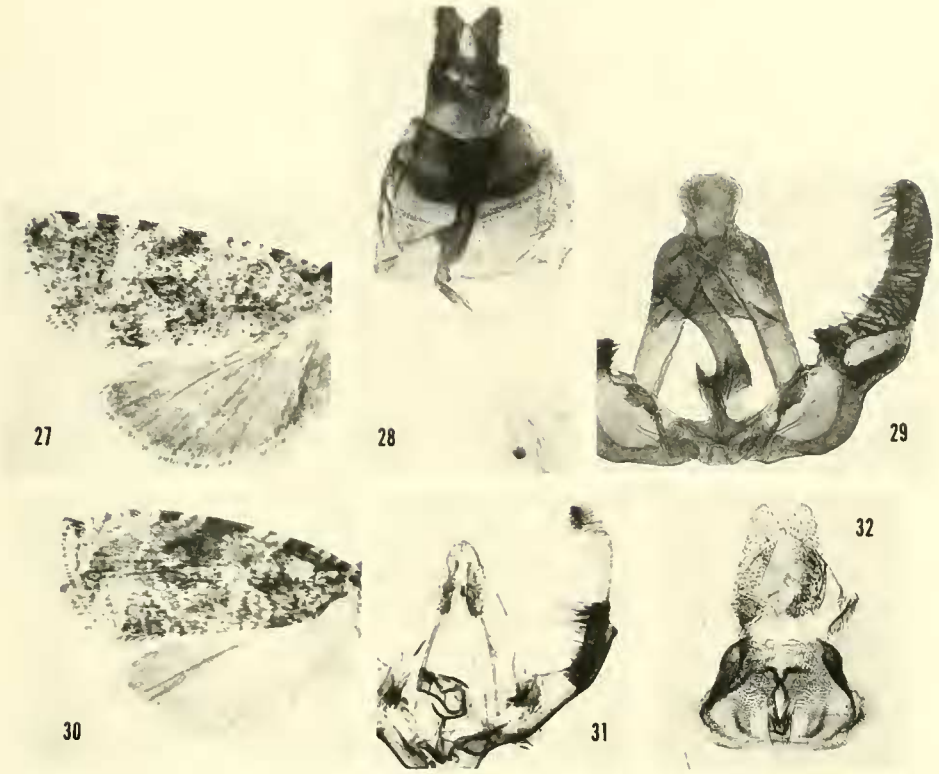
Olethreutes obsoletana (Zetterstedt)

Figs. 27–29

Tortrix obsoletana Zetterstedt (1840: 980) (lectotype designated by Benander, 1940: male, Lapland, Raschstind, no date, in UL).

Olethreutes kennethana McDunnough (1941: 99) (holotype: Edmonton, Alberta, 1 August 1940, K. Bowman, No. 5213, in CN). NEW SYNONYMY.

Discussion.—I found no differences between nearctic and palaearctic examples in maculation (Fig. 27) (24 n and 10 n, respectively), female genitalia (Fig. 28) (3 n each), or male genitalia (Fig. 29) (5 n and 3 n, respectively). Both nearctic and



Figs. 27–32. *Olethreutes obsoletana* and *O. troglodana*. 27, Wings of *O. obsoletana* female from Great Bear Lake, Canada. 28, Sterigma and associated structures of female *O. obsoletana* from preceding locality (prep. WEM 37842). 29, Male genitalia of *O. obsoletana* from Dietrich R., Alaska (prep. WEM 107841). 30, Wings of *O. troglodana* male from Oneida Co., Wis. 31, Male genitalia of *O. troglodana* from Putnam Co., Ill. (prep. MOG 355). 32, Sterigma and associated structures of female *O. troglodana* from Jockuale, Ont. (prep. MAM 24791).

palaearctic samples showed only part of the range of variation in maculation illustrated by Bradley et al. (1979). Genitalia of palaearctic examples are illustrated by Pierce and Metcalfe (1922), Kuznetsov (1978), and others. The nearctic sample originated in Alaska, Alberta, and the Northwest Territories (Great Bear Lake), and included four *O. kennethana* paratypes (24 n) (AM, CN, UMN); the palaearctic sample, in Germany, Lapland, Scotland, and the USSR (Murmansk) (10 n) (BM, NM).

Forewing length of nearctic examples ranges from 7.0 to 8.0 mm (10 n), and capture dates from 29 June to 1 August (24 n). The larval host is unknown.

Olethreutes troglodana (McDunnough)

Figs. 30–32

Exartema troglodanum McDunnough (1922: 37) (holotype: male, Meach Lake, Que., June 17, C. H. Young, in CN).
Exartema troglodanum (part); Heinrich (1926: 159).
Olethreutes troglodanum; Diakonoff (1973: 484).

Discussion.—The maculation of *O. troglodana* (Fig. 30) is like that of several other species of *Olethreutes*. Such similarities increase chances of taxonomic confusion. In the original description, only the distinctive male valva is shown (McDunnough, 1922). The female genitalia supplied later by Heinrich (1926: fig. 219) are implausible given the divergent male genitalia (Fig. 31). Also, they represent an undocumented association of sexes. Females whose genitalia are depicted here (Fig. 32) (2 n) are associated with authentic males. The association is based on same localities of capture in Ontario (CN) and Illinois (IS), and proximate capture dates (24–28 June, 6–16 June). The scobinate female signum is not shown here; it is rudimentary and barely visible.

The larval host is unknown.

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